Completed Return on Investment Project Case Study

United States Department of Energy
Office of Environmental Management
Fact Sheet

Reduction in Acid Wastes and Emissions from TA-59

Los Alamos National Laboratory

Original Problem

Filter, soil, and biological samples are collected from LANL and the surrounding area and sent to C-9 for trace inorganic element analysis and radiochemical analysis for environmental and health monitoring programs. These samples were previously digested in various acids using hot plates in a fume hood, and about 3000kg of acid volatized into the atmosphere every year from this procedure.

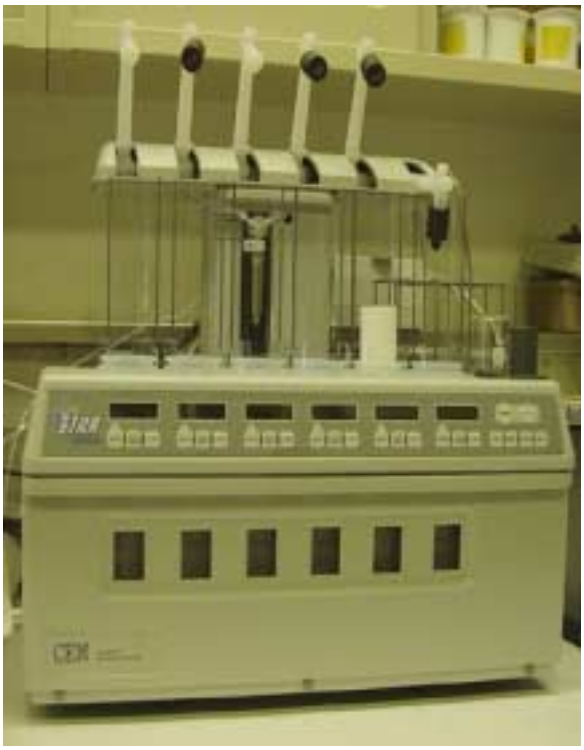
The Project Solution

Special microwave ovens, open vessel and closed vessel, were purchased to replace the hot plates for the sample digestions. In addition, the extraction procedure was improved by baking the sample in a muffle furnace to oxidize as much organic matter as possible before the acid was added.

Value of Improvement

The microwave ovens can control the temperature of the samples much more accurately than hot plates. The volatilized acid recondenses in the microwaves or is trapped by a liquid scrubber instead of being vented. Less acid is required to dissolve the samples after they have been baked in a muffle furnace.

Lifecycle Waste Reduction	
Lifecycle Waste Reduction	~1500kg /year
Commencement Date	1999
Project Useful Life (Years)	10



DOE Monetary Benefits	
Total Project Cost	$129,000
Lifecycle Savings	~$50,000 / year
Return on Investment	82%

Benefits At-A-Glance

- The new process releases much less acid into the atmosphere than the old process.
- Procurement expenses for virgin acids and other reagents are reduced.
- Unlike hot plates, microwave ovens can heat the samples to exactly the right temperature and achieve better results.

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Summary Data	
Priority Area:	Waste Minimization Projects
Project Type:	Source Reduction
Total Project Cost:	$129,000
Lifecycle Savings:	~$50,000 per year
Implementing Group:	C-9
Benefiting Group:	C-9
Useful Life Years:	10
Return on Investment:	82%
Lifecycle Waste Reduction:	~1500kg of hydrofluoric acid, hydrochloric acid, and nitric acid / year.
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Building Upon An Office of Science and Technology Demonstration Success